



Office of Surface Mining Impact of Blasting on Domestic Wells

Executive Summary

Daniel B. Stephens & Associates, Inc. (DBS&A) was contracted by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to design and initiate a long-term study to investigate possible effects of mining operations on groundwater quality and supply in domestic wells. The study was conducted between November 2000 and December 2001 and consisted of four field data collection periods and subsequent data analysis.

During each of the monitoring periods, field personnel attempted to collect data deemed necessary to determine effects of mining operations on nearby domestic wells, including vibration/blasting, water quality, and well yield data. Data from the initial monitoring period are the most complete. Unforeseen issues in data collection and removal of sites from the study for various reasons resulted in progressively less complete data sets in each of the remaining data collection periods, and during the final period, only one site of the original ten selected could be monitored.

Vibration data became more sparse as the study progressed because mine blasting was conducted at increasingly larger distances from the study sites, compared to the distances involved during the initial monitoring period. Ground movements produced by blasting activities were attenuated by the greater distances and were in many instances not strong enough to trigger the seismographs, indicating little vibratory effect in the ground surrounding the wells.

Few changes that could be directly attributed to a blast event were observed in the water quality and well yield data collected. Water quality parameters did change slightly over time during measuring periods, but these changes seem to be unrelated to blasting, but rather a result of sensor drift and mixing of the water in the well due to pump cycling. Well yield and water level remained in a constant range throughout each individual monitoring season.